

## CLAIMS

What is claimed is:

1. A method for determining an auction format for a market, said  
5 method comprising the steps of:
  - selecting characteristics of said market;
  - selecting a relevant bidding model;
  - estimating a structure of said market;
  - predicting a bidding behavior;
  - 10 predicting a first outcome of said market; and
  - evaluating said first outcome of said market.
2. The method as recited in Claim 1, wherein said selecting  
characteristics of said market step comprises the steps of:
  - 15 receiving a first user input, wherein said first user input  
comprises information identifying an item to be auctioned;
  - accessing a database;
  - retrieving from said database historical bids data;
  - retrieving from said database auction characteristics data,
  - 20 wherein said auction characteristics comprise information relating to  
historical auctions of similar items;
  - outputting said bids data; and
  - outputting said auction characteristics data.

3. The method as recited in Claim 1, wherein said selecting a relevant bidding model step comprises the steps of:

receiving said auction characteristics data;

5 accessing a database;

retrieving from said database a relevant bidding model,

wherein said bidding model is selected based on a corresponding relevance of said auction characteristics data; and

outputting said relevant bidding model.

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4. The method as recited in Claim 1, wherein said estimating a structure of said market step comprises the steps of:

receiving said relevant bidding model;

receiving said bids data;

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expressing unobservable variables in terms of observable bids, wherein said unobservable variables are expressed in terms of observable bids by inverting said bid model;

transforming said bids data to a sample of inverted bids,

wherein said bids data are transformed by inverting said bid model;

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estimating an estimated latent structure of said market, wherein said sample of inverted bids receives application of statistical density estimation techniques to obtain said estimated structure; and

outputting said estimated structure.

5. The method as recited in Claim 1, wherein said bidding model has embedded an unknown structure, and wherein said predicting a bidding behavior step comprises the steps of:
- receiving said estimated structure;
  - receiving said relevant bidding model;
  - substituting said estimated structure for said unknown structure; and
  - outputting a prediction of bidding behavior.

6. The method as recited in Claim 1, wherein said predicting a first outcome of said market step comprises the steps of:
- receiving a second user input, wherein said second user input comprises:
    - an evaluation criterion;
    - a candidate auction format; and
    - a constraint;
  - receiving said estimated structure;
  - receiving said bidding behavior prediction for said candidate auction format, wherein said bidding behavior prediction further comprises a prediction under said constraint;

obtaining a value of said evaluation criterion, wherein said value is based on said estimated structure, said bidding behavior prediction, said candidate auction format, and said constraint, said value comprising said first predicted outcome; and

5           outputting said value.

7.     The method as recited in Claim 1, wherein said evaluating said first outcome of said market step comprises the steps of:

          receiving a third user input, wherein said third user input  
10       comprises a plurality of candidate auction formats;

          receiving a predicted outcome for each said candidate auction  
format;

          calculating descriptive statistics for each said candidate  
15       auction format, wherein said descriptive statistics comprise a mean  
and a variance;

          ranking each said candidate auction format with respect to  
said calculated mean and generating corresponding rankings for  
said plurality; and

          outputting said descriptive statistics and said rankings.  
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8.     The method as recited in Claim 7, wherein said evaluating said first outcome of said market step further comprises the steps of:

selecting a best auction format, wherein said best auction format comprises the candidate auction format within said plurality having the highest said ranking; and  
outputting said best auction format.

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9. A computer system comprising:

a bus;

a memory interconnected with said bus; and

a processor interconnected with said bus, wherein said processor

10 executes a method for determining an auction format for a market, said method comprising the steps of:

selecting characteristics of said market;

selecting a relevant bidding model;

estimating a structure of said market;

15 predicting a bidding behavior;

predicting a first outcome of said market; and

evaluating said first outcome of said market.

10. The system as recited in Claim 9, wherein said selecting  
20 characteristics of said market step of said method comprises the steps of:

receiving a first user input, wherein said first user input

comprises information identifying an item to be auctioned;

accessing a database;

retrieving from said database historical bids data;  
retrieving from said database auction characteristics data,  
wherein said auction characteristics comprise information relating to  
historical auctions of similar items;  
5           outputting said bids data; and  
          outputting said auction characteristics data.

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11.   The system as recited in Claim 9, wherein said selecting a  
relevant bidding model step of said method comprises the steps of:  
10           receiving said auction characteristics data;  
          accessing a database;  
          retrieving from said database a relevant bidding model,  
wherein said bidding model is selected based on a corresponding  
relevance of said auction characteristics data; and  
15           outputting said relevant bidding model.

12.   The system as recited in Claim 9, wherein said estimating a  
structure of said market step of said method comprises the steps of:  
          receiving said relevant bidding model;  
20           receiving said bids data;  
          expressing unobservable variables in terms of observable  
bids, wherein said unobservable variables are expressed in terms of  
observable bids by inverting said bid model;

transforming said bids data to a sample of inverted bids,  
wherein said bids data are transformed by inverting said bid model;  
estimating an estimated latent structure of said market,  
wherein said sample of inverted bids receives application of  
5 statistical density estimation techniques to obtain said estimated  
structure; and  
outputting said estimated structure.

13. The system as recited in Claim 9, wherein said bidding model  
10 has embedded an unknown structure, and wherein said predicting a  
bidding behavior step of said method comprises the steps of:  
receiving said estimated structure;  
receiving said relevant bidding model;  
substituting said estimated structure for said unknown  
15 structure; and  
outputting a prediction of bidding behavior.

14. The system as recited in Claim 9, wherein said predicting a  
first outcome of said market step of said method comprises the steps of:  
20 receiving a second user input, wherein said second user  
input comprises:  
an evaluation criterion;  
a candidate auction format; and

a constraint;

receiving said estimated structure;

receiving said bidding behavior prediction for said candidate  
auction format, wherein said bidding behavior prediction further  
comprises a prediction under said constraint;

obtaining a value of said evaluation criterion, wherein said  
value is based on said estimated structure, said bidding behavior  
prediction, said candidate auction format, and said constraint, said  
value comprising said first predicted outcome; and

outputting said value.

15. The system as recited in Claim 9, wherein said evaluating  
said first outcome of said market step of said method comprises the steps  
of:

receiving a third user input, wherein said third user input  
comprises a plurality of candidate auction formats;

receiving a predicted outcome for each said candidate auction  
format;

calculating descriptive statistics for each said candidate  
auction format, wherein said descriptive statistics comprise a mean  
and a variance;



ranking each said candidate auction format with respect to  
said calculated mean and generating corresponding rankings for  
said plurality; and

outputting said descriptive statistics and said rankings.

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16. The system as recited in Claim 15, wherein said evaluating  
said first outcome of said market step of said method further comprises the  
steps of:

selecting a best auction format, wherein said best auction

10 format comprises the candidate auction format within said plurality  
having the highest said ranking; and

outputting said best auction format.

17. A computer readable medium for causing a computer system  
15 to execute the steps in a method for determining a auction format for a  
market, said method comprising the steps of:

selecting characteristics of said market;

selecting a relevant bidding model;

estimating a structure of said market;

20 predicting a bidding behavior;

predicting a first outcome of said market; and

evaluating said first outcome of said market.

18. The computer readable medium as recited in Claim 17,  
wherein said selecting characteristics of said market step of said method  
comprises the steps of:

receiving a first user input, wherein said first user input  
5 comprises information identifying an item to be auctioned;  
accessing a database;  
retrieving from said database historical bids data;  
retrieving from said database auction characteristics data,  
wherein said auction characteristics comprise information relating to  
10 historical auctions of similar items;  
outputting said bids data; and  
outputting said auction characteristics data.

19. The computer readable medium as recited in Claim 17,  
15 wherein said selecting a relevant bidding model step of said method  
comprises the steps of:

receiving said auction characteristics data;  
accessing a database;  
retrieving from said database a relevant bidding model,  
20 wherein said bidding model is selected based on a corresponding  
relevance of said auction characteristics data; and  
outputting said relevant bidding model.

20. The computer readable medium as recited in Claim 17,  
wherein said estimating a structure of said market step of said method  
comprises the steps of:

- receiving said relevant bidding model;
- 5 receiving said bids data;
- expressing unobservable variables in terms of observable  
bids, wherein said unobservable variables are expressed in terms of  
observable bids by inverting said bid model;
- transforming said bids data to a sample of inverted bids,  
10 wherein said bids data are transformed by inverting said bid model;
- estimating an estimated latent structure of said market,  
wherein said sample of inverted bids receives application of  
statistical density estimation techniques to obtain said estimated  
structure; and
- 15 outputting said estimated structure.

21. The computer readable medium as recited in Claim 17,  
wherein said bidding model has embedded an unknown structure, and  
wherein said predicting a bidding behavior step of said method comprises  
20 the steps of:

- receiving said estimated structure;
- receiving said relevant bidding model;

substituting said estimated structure for said unknown structure; and  
outputting a prediction of bidding behavior.

5           22. The computer readable medium as recited in Claim 17, wherein said predicting a first outcome of said market step of said method comprises the steps of:

receiving a second user input, wherein said second user input comprises:

10                   an evaluation criterion;  
a candidate auction format; and  
a constraint;

receiving said estimated structure;

receiving said bidding behavior prediction for said candidate  
15 auction format, wherein said bidding behavior prediction further comprises a prediction under said constraint;

obtaining a value of said evaluation criterion, wherein said value is based on said estimated structure, said bidding behavior prediction, said candidate auction format, and said constraint, said  
20 value comprising said first predicted outcome; and  
outputting said value.

23. The computer readable medium as recited in Claim 17, wherein said evaluating said first outcome of said market step of said method comprises the steps of:

receiving a third user input, wherein said third user input  
5 comprises a plurality of candidate auction formats;  
receiving a predicted outcome for each said candidate auction  
format;  
calculating descriptive statistics for each said candidate  
10 auction format, wherein said descriptive statistics comprise a mean  
and a variance;  
ranking each said candidate auction format with respect to  
said calculated mean and generating corresponding rankings for  
said plurality; and  
15 outputting said descriptive statistics and said rankings.

24. The computer readable medium as recited in Claim 23, wherein said evaluating said first outcome of said market step of said method further comprises the steps of:

selecting a best auction format, wherein said best auction  
20 format comprises the candidate auction format within said plurality  
having the highest said ranking; and  
outputting said best auction format.